

1. A link layer controller comprising:

a network layer interface configured to exchange packets with a network layer system and transfer a status signal to the network layer system;

a physical layer interface configured to exchange the packets with a physical layer system; and

a memory controller configured to exchange the packets with the network layer interface, exchange the packets with a memory, exchange the packets with the physical layer interface, and generate the status signal to indicate available space in the memory.

2. The link layer controller of claim 1 wherein the memory includes a plurality of transmit buffers and wherein the status signal indicates the available space in each of the transmit buffers.

3. The link layer controller of claim 2 wherein the memory controller is configured to control a size of each of the transmit buffers in response to external instructions.

4. The link layer controller of claim 3 wherein each of the transmit buffers corresponds to a transmit channel and the memory controller is configured to provide transmit priority to one of the transmit channels with transmit buffer occupancy exceeding a threshold.

5. The link layer controller of claim 1 wherein the network layer interface is configured to use a packet exchange bus to exchange the packets with the network layer system and to transfer the status signal to the network layer system.

6. The link layer controller of claim 5 wherein the network layer interface is configured to use the packet exchange bus to exchange parity information with the network layer system.

7. The link layer controller of claim 5 wherein the network layer interface is configured to use the packet exchange bus to exchange data validity information with the network layer system.

8. The link layer controller of claim 5 wherein the network layer interface is configured to use the packet exchange bus to exchange start of packet information and end of packet information with the network layer system.

9. The link layer controller of claim 5 wherein the network layer interface is configured to use the packet exchange bus to transfer a synchronization signal to the network layer system.

10. The link layer controller of claim 5 wherein the network layer interface is configured to use the packet exchange bus to exchange stop transfer signals with the network layer system.

11. A method of operating a communications device, the method comprising:
transferring packets between a network layer system and a link layer system;
transferring the packets between the link layer system and a physical layer system;
transferring the packets between the physical layer system and a communication path;
generating a status signal in the link layer system indicating available space in link layer memory;
transferring the status signal from the link layer system to the network layer system;
processing the status signal in the network layer system to control the exchange of the packets between the network layer system and the link layer system.

12. The method of claim 11 wherein processing the status signal in the network layer system to control the exchange comprises preventing over-run.

13. The method of claim 11 wherein processing the status signal in the network layer system to control the exchange comprises preventing under-run.

5 14. The method of claim 11 wherein the link layer memory includes a plurality of transmit buffers that each correspond to a transmit channel, wherein the status signal indicates the available space in each of the transmit buffers, and further comprising:
controlling a size of each of the transmit buffers in the link layer system in response to instructions from the network layer system; and
10 providing transmit priority to one of the transmit channels if corresponding buffer occupancy exceeds a threshold.

15 15. The method of claim 11 wherein transferring the packets and the status signal between the network layer system and the link layer system comprises using a packet exchange bus.

16. The method of claim 15 further comprising transferring parity information over the packet exchange bus.

20 17. The method of claim 15 further comprising transferring data validity information over the packet exchange bus.

18. The method of claim 15 further comprising transferring start of packet information and end of packet information over the packet exchange bus.

25 19. The method of claim 15 further comprising transferring a synchronization signal over the packet exchange bus.

30 20. The method of claim 15 further comprising transferring stop transfer signals over the packet exchange bus.